

FO6280-8224650

1 What is claimed is:

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3 1. A nozzle of a rocket propulsion system for propelling a  
4 vehicle during a launch phase, the nozzle comprising,

5 a cone for exhausting exhaust from the rocket propulsion  
6 system, and

7 combustible material disposed on an interior surface of the  
8 cone, the exhaust igniting the combustible material outgassing  
9 diversion gases creating an outgassing diversion pressure upon  
10 the exhaust for diverting the exhaust gases away from the  
11 interior surface during the launch phase.

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15 2. The nozzle of claim 1 wherein,

16 the combustible material is a solid rocket propellant.

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20 3. The nozzle of claim 1 wherein,

21 the cone is bell shaped.

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26 4. The nozzle of claim 1 wherein,

27 the combustible material circumferentially lines the  
28 interior surface of an aft end of the cone.

1 5. The nozzle of claim 1 wherein,

2 the combustible material is tapered in thickness from a zero  
3 thickness at a forward end to a final thickness at an aft end.

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8 6. The nozzle of claim 1 wherein,

9 the combustible material is tapered in thickness from a  
10 zero thickness at a forward end to a final thickness at an aft  
11 end, and

12 the forward end has a leading edge moving down the  
13 interior of the cone during burning of the combustible material  
14 during the launch phase decreasing the outgassing diversion  
15 pressure.

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17 7. The nozzle of claim 1 wherein,

18 the combustible material is tapered in thickness from a  
19 zero thickness at a forward end to a final thickness at an aft  
20 end,

21 the forward end has a leading edge moving down the  
22 interior of the cone during burning of the combustible material  
23 during the launch phase for decreasing the outgassing diversion  
24 pressure during the launch phase, and

25 the decreasing of the outgassing diversion pressure  
26 tending to increase an effective expansion ratio of the cone.

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1 8. The nozzle of claim 1 wherein,

2 the combustible material is tapered in thickness from a  
3 zero thickness at a forward end to a final thickness at an aft  
4 end,

5 the forward end having a leading edge moving down the  
6 interior of the cone during burning of the combustible material  
7 during the launch phase for decreasing the outgassing diversion  
8 pressure during the launch phase, and

9 the decreasing outgassing diversion pressure tending to  
10 increase an effective expansion ratio of the cone during the  
11 launch phase for increasing an effective lift capability of the  
12 rocket propulsion system.

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1 9. A bell nozzle of rocket propulsion system for propelling a  
 2 vehicle during a launch phase, the nozzle comprising,  
 3 a bell shaped cone for exhausting exhaust from the rocket  
 4 propulsion system, and  
 5 a combustible material circumferentially lining an aft end  
 6 interior surface of the bell shaped cone, the combustible  
 7 material disposed on an interior surface of the bell shaped  
 8 cone, the combustible material being tapered in thickness from  
 9 a zero thickness at a forward end to a final thickness at the  
 10 aft end, the exhaust igniting the solid rocket propellant for  
 11 outgassing diversion gases for creating an outgassing diversion  
 12 pressure upon the exhaust for diverting the exhaust gases  
 13 during the launch phase, the forward end having a leading edge  
 14 moving down the interior of the bell shaped cone during burning  
 15 of the solid rocket propellant for decreasing the outgassing  
 16 diversion pressure during the launch phase, the decreasing  
 17 outgassing diversion pressure tending to increase an effective  
 18 expansion ratio of the bell shaped cone during the launch  
 19 phase.

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1 10. A bell nozzle of rocket propulsion system for propelling a  
2 vehicle during a launch phase, the nozzle comprising,  
3 a bell shaped cone for exhausting exhaust from the  
4 propulsion system, and  
5 a solid rocket propellant circumferentially lining an aft  
6 end interior surface of the bell shaped cone, the solid rocket  
7 propellant being disposed on an interior surface of the bell  
8 shaped cone, the solid rocket propellant being tapered in  
9 thickness from a zero thickness at a forward end to a final  
10 thickness at the aft end, the exhaust igniting the solid rocket  
11 propellant for outgassing diversion gases for creating an  
12 outgassing diversion pressure upon the exhaust for diverting  
13 the exhaust gases during the launch phase, the forward end  
14 having a leading edge moving down the interior of the bell  
15 shaped cone during burning of the solid rocket propellant for  
16 decreasing the outgassing diversion pressure during the launch  
17 phase, the decreasing outgassing diversion pressure tending to  
18 increase an effective expansion ratio of the bell shaped cone  
19 during the launch phase for increasing an effective lift  
20 capability of the rocket propulsion system.

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